Claims

1. Device (9) for mixing fibers in a gaseous flow, comprising a duct (11) for suspending fibers in a gaseous flow, with an inlet (13) and an outlet (15) and, between said inlet and said outlet, a plurality of rotors (16-19) perpendicular to said flow and equipped with radial elements (43).

2. Device according to Claim 1, comprising at least two pairs of rotors, the rotors of each pair having axes of rotation parallel to each other.

3. Device according to Claim 1 or 2, in which the rotors of the various pairs have axes of rotation parallel to each other.

4. Device according to one or more of the preceding claims, comprising at least a first pair of rotors (16, 17) on the inlet side and a second pair of rotors (18, 19) on the outlet side.

5. Device according to Claim 4, in which the rotors of the first pair rotate in opposite directions to each other and the rotors of the second pair rotate in opposite directions to each other.

6. Device according to Claim 5, in which the rotors (16, 17) of the first pair rotate so as to tend to produce a denser arrangement of the fibers in the passing flow toward the central zone of the duct (11), while the rotors (18, 19) of the second pair rotate so as to tend to produce a denser arrangement of the fibers in the passing flow toward the peripheral zone of the duct.

7. Device according to Claim 5, in which the rotors (16, 17) of the first pair rotate so as to tend to produce a denser arrangement of the fibers in the passing flow toward the peripheral zone of the duct (11), while the rotors (18, 19) of the second pair rotate so as to tend to produce a denser arrangement of the fibers in the passing flow toward the central zone of the duct.

8. Device according to one or more of the preceding claims, in which the radial elements (43) of said rotors comprise rod-shaped members constrained to a respective rotating shaft (41).

9. Device according to one or more of the preceding claims, in which said duct (11) has at least one portion with a rectangular or square cross-section, in which said rotors are inserted.

10. Device according to one or more of the preceding claims, in which said radial elements (43) have an extension such that the envelopes of adjacent rotors interfere with each other.

11. Device according to one or more of the preceding claims, in which said duct (11) has a transversal cross-section which is smaller than said inlet (13) and said outlet (15).

12. Device according to one or more of the preceding claims, in which said rotors are actuated at a variable speed.

13. A device for dry-forming a strip-shaped fibrous material, comprising a pervious forming wire (3), a forming head (5) on a first side of said wire and a suction box (7) on the opposite side of said wire, said forming head being supplied, by means of a supply duct (8), with fibers suspended in a gaseous flow, characterized in that a mixing device according to one or more of Claims 1 to 12 is arranged in said supply duct.

14. Method for forming a strip-shaped fibrous article, comprising the steps of:

- supplying fibers suspended in a gaseous flow to a forming head (5) by means of a supply duct (8);

- depositing a layer of fibers by means of said forming head (5) onto a movable forming wire (3),

characterized by mixing said fibers in a gaseous suspension inside said supply duct.

15. Method according to Claim 14, characterized by producing a denser arrangement of fibers in the central zone of the duct and subsequently a denser arrangement of the fibers in the peripheral zone of the supply duct.

16. Method according to Claim 14, characterized by producing a denser arrangement of fibers in the peripheral zone of the duct and subsequently a denser arrangement of fibers in the central zone of the supply duct.

17. Method according to one or more of Claims 14 to 16, characterized by arranging in said supply duct at least a first pair (16, 17) and at least a second pair (18, 19) of rotors counter-rotating about axes

perpendicular to the flow inside said duct, said first and second pair of rotors being arranged one following the other in the direction of the flow inside said supply duct.

Amended Claims

1. Device (9) for mixing fibers in a gaseous flow, comprising a duct (11) for suspending fibers in a gaseous flow, with an inlet (13) and an outlet (15) and, between said inlet and said outlet, at least a first pair of rotors (16, 17) on the inlet side and a second pair of rotors (18, 19) on the outlet side, said rotors being arranged perpendicular to said flow and equipped with radial elements (43).

2. Device according to Claim 1, wherein the rotors of each pair have axes of rotation parallel to each other.

3. Device according to Claim 1 or 2, in which the rotors of the various pairs have axes of rotation parallel to each other.

4. Device according to one or more of the preceding Claims, in which the rotors of the first pair rotate in opposite directions to each other and the rotors of the second pair rotate in opposite directions to each other.

5. Device according to Claim 4, in which the rotors (16, 17) of the first pair rotate so as to tend to produce a denser arrangement of the fibers in the passing flow toward the central zone of the duct (11), while the rotors (18, 19) of the second pair rotate so as to tend to produce a denser arrangement of the fibers in the passing flow toward the peripheral zone of the duct.

6. Device according to Claim 4, in which the rotors (16, 17) of the first pair rotate so as to tend to produce a denser arrangement of the fibers in the passing flow toward the peripheral zone of the duct (11), while the rotors (18, 19) of the second pair rotate so as to tend to produce a denser arrangement of the fibers in the passing flow toward the central zone of the duct.

7. Device according to one or more of the preceding claims, in which the radial elements (43) of said rotors comprise rod-shaped members constrained to a respective rotating shaft (41).

8. Device according to one or more of the preceding claims, in which said duct (11) has at least one portion with a rectangular or square cross-section, in which said rotors are inserted.

9. Device according to one or more of the preceding claims, in which said radial elements (43) have an extension such that the envelopes of adjacent rotors interfere with each other.

10. Device according to one or more of the preceding claims, in which said duct (11) has a transversal cross-section which is smaller than said inlet (13) and said outlet (15).

11. Device according to one or more of the preceding claims, in which said rotors are actuated at a variable speed.

12. A device for dry-forming a strip-shaped fibrous material, comprising a pervious forming wire (3), a forming head (5) on a first side of said wire and a suction box (7) on the opposite side of said wire, said forming head being supplied, by means of a supply duct (8), with fibers suspended in a gaseous flow, characterized in that a mixing device according to one or more of Claims 1 to 11 is arranged in said supply duct, upstream of said forming head (5).

13. Method for forming a strip-shaped fibrous article, comprising the steps of:

- supplying fibers suspended in a gaseous flow to a forming head (5) by means of a supply duct (8);
- depositing a layer of fibers by means of said forming head (5) onto a movable forming wire (3),

characterized by

- arranging in said supply duct at least a first pair of rotors (16, 17) and at least a second pair of rotors(18, 19), said first and second pair of rotors being arranged one following the other in the direction of the flow inside said supply duct;
- counter-rotating the rotors of each pair about axes perpendicular to the flow inside said duct,
- mixing said fibers in a gaseous suspension inside said supply duct by means of said rotors before feeding said fibers to said forming head.

14. Method according to Claim 13, characterized by producing a denser arrangement of fibers in the central zone of the duct and subsequently a denser arrangement of the fibers in the peripheral zone of

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the supply duct.

15. Method according to Claim 13, characterized by producing a denser arrangement of fibers in the peripheral zone of the duct and subsequently a denser arrangement of fibers in the central zone of the supply duct by means of said two pairs of rotors.